Brief communication

ACTIVE MAMMARY EXCRETION OF N4-ACETYLATED p-AMINOHIPPURIC ACID*)

Different excretion patterns were observed for p-amino-hippuric acid and its acetylated metabolite in mammary excretion experiments in goats and cows. The excretion of p-aminohippuric acid conformed to passive diffusion of the non-protein bound and un-ionized fraction (*Rasmussen* 1958, 1966) as described by *Miller et al.* (1967). Thus, the p-aminohippuric acid (pK_a 3.8) appeared in ultrafiltrates of milk in concentrations 1/4—1/10 of the concentrations in ultrafiltrates of blood plasma. The concentrations of acetylated p-aminohippuric acid (pK_a 3.9) in ultra-filtrates of milk were on the other hand equal to or higher than in ultrafiltrates of blood plasma.

Further experiments were conducted by intravenous infusion of acetylated p-aminohippuric acid using the equilibrium technique described by *Rasmussen* (1958). After acid hydrolysis the concentrations of acetylated p-aminohippuric acid in milk and blood plasma were estimated according to the method described by *Bratton & Marshall* (1939). It may be seen from the results listed in Table 1 that the concentrations of acetylated p-amino-hippuric acid in milk and in ultrafiltrates of milk are equal to or higher than in plasma (ratio M/P) and ultrafiltrates of plasma (ratio M.Ultr./P.Ultr.), respectively. The theoretical ratios for an equilibrium by passive diffusion were calculated from the formula

$$\frac{\text{Milk Ultr.}}{\text{Plasma Ultr.}} = \frac{1 + 10^{(pH_{milk} - pK_a)}}{1 + 10^{(pH_{blood} - pK_a)}}$$

and are listed in the last column of Table 1. The experimentally found ratios M.Ultr./P.Ultr. are 3—30 times higher than the calculated. The data presented in Table 1 also demonstrate that

Table 1. Concentrations of acetylated p-aminohippuric acid in milk and blood plasma and in ultrafiltrates of milk and blood plasma.

Animal	Plasma μg/ml	Milk μg/ml	Ratio M/P	Ultrafiltrate of plasma μg/ml	Ultrafiltrate of milk μg/ml	M. Ultr./ P. Ultr. experimental	Milk pH	M. Ultr./ P. Ultr. theoretical
Cow 93	2.0	8.2	4.1	2.0	7.5	3.8	6.75	0.20
Cow 93	2.0	7.5	3.8	2.0	6.9	3.5	6.65	0.16
Goat 40	3.7	12.5	3.4	3.7	12.5	3.4	6.60	0.16
Goat 40	8.8	27.0	3.1	8.3	27.0	3.2	6.50	0.10
Cow 93	9.4	17.5	1.9	9.4	17.5	1.9	6.70	0.16
Cow 93	9.4	16.3	1.7	9.4	16.3	1.7	7.00	0.32
Goat 36	14.8	29.5	2.0	13.5	27.1	2.0	7.40	0.79
Cow 83	21.1	17.3	0.8	18.4	17.3	0.9	6.60	0.14
Goat 40	23.6	37.8	1.6	19.6	37.8	1.9	6.70	0.20

the milk-to-plasma ratios decrease with increasing concentrations of acetylated p-aminohippuric acid in plasma. Thus, the results indicate that an active saturable excretory process is involved in the mammary excretion of acetylated p-aminohippuric acid.

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